

App. No.: 10/695,969**RECEIVED
CENTRAL FAX CENTER****REMARKS****AUG 21 2006**

Claims 1-3, 5, and 11 are pending after this amendment adds new claim 11. No new matter is added by the new claims, which find support throughout the specification and figures. In particular, the amendments to the claims are supported by figure 3 and page 8, lines 13-26, of the specification. In view of the amendments and the following remarks, reconsideration of the instant application is respectfully requested.

A. 35 U.S.C. 102(e) rejection of claims 1 and 5

Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being unpatentable over United States Patent No. 6,674,131 to Yokogawa et al. (hereinafter referred to as Yokogawa). Applicants respectfully traverse.

Claim 1 relates to a semiconductor integrated circuit that includes, inter alia, a *silicon substrate* and a *silicon epitaxial layer that touches the surface of said silicon substrate* and has a lower resistivity than the resistivity of said silicon substrate. The semiconductor integrated circuit of claim 1 also includes first and second circuit sections formed in said silicon epitaxial layer and a device isolation region projecting from said silicon substrate up to a surface of each of said first and second circuit sections between said first and second circuit sections.

The Examiner asserts that the element indicated by the reference numeral 10 in figure 1 of Yokogawa discloses a silicon substrate (Office Action; page 2, line 17; citing Yokogawa; figure 1, and col. 5, line 40). However, this is incorrect. The element indicated by the reference numeral 10 is an SiC substrate, as described on line 40 of column 5 of Yokogawa. In Yokogawa, it is mentioned that compound semiconductors other than SiC may be used as the substrate. However, Yokogawa includes no description that Si is applicable as the substrate

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(Yokogawa; col. 12, lines 26-33). As Yokogawa states in the Description Of The Background Art, the invention of Yokogawa aims at providing a *compound semiconductor having a band-gap larger than that of Si* (Yokogawa; col. 1, lines 13-18). Therefore the invention of Yokogawa does not aim at providing an Si substrate, and in fact Yokogawa *teaches away* from the use of Si as a substrate. On the other hand, claim 1 recites that the substrate is a silicon substrate. Since Yokogawa does not disclose or suggest the feature of an Si substrate, Yokogawa does not anticipate claim 1.

Additionally, Yokogawa does not disclose or suggest the feature of claim 1 of a silicon epitaxial layer that touches the surface of said silicon substrate. The Examiner asserts that layer 12a discloses this feature (Office Action; page 2, line 18; citing Yokogawa; col. 5, line 53). However, the epitaxial layer (actually layers 12a and 12b) of Yokogawa is made at least partly of 4H-SiC single crystal, as described on lines 52-57 of column 5. Layer 12 of Yokogawa therefore does not disclose or suggest an *epitaxial layer composed of silicon*. Therefore, for at least this additional reason, Yokogawa does not anticipate the invention according to claim 1.

Furthermore, there is no disclosure in Yokogawa that layer 12a has a lower resistivity than the substrate. Yokogawa does apparently disclose that a current flows easily through layer 12a when a forward bias is applied to Schottky diode 20. (Yokogawa; col. 7, lines 49-57). However, there is no discussion of the *relative resistivity* of the layer 12a and the substrate 10. Therefore this additional feature of claim 1 is not disclosed or suggested by Yokogawa.

Accordingly, Applicants respectfully submit that independent claim 1 is not anticipated by Yokogawa, and that independent claim 1 is therefore in condition for allowance. As dependent claim 5 depends from independent claim 1, Applicants further submit that dependent claim 5 is also allowable for at least this reason.

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B. 35 U.S.C. 103(a) rejection of claims 2 and 3

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa. Applicants respectfully traverse.

The Examiner admits in the rejection of dependent claim 2 that Yokogawa does not disclose the feature of the ratio of resistivity of the silicon substrate being 20 to 100 times the resistivity of the silicon epitaxial layer. However, the Examiner asserts that such a feature would have been obvious and within the ability of one skilled in the art. (Office Action; page 3, section 4). However, the particular resistivity of the present invention as recited in claim 2 has the advantage recited in the specification that:

noise electric current flowing in the support substrate is effectively inhibited while the resistivity of the semiconductor layer is maintained in a range where the platform of the conventional device process can be used.

(Specification; page 6, lines 11-15). This effect is also shown in figure 4 of the present application. Yokogawa does not disclose or suggest any particular concentration relationship between the substrate and the epitaxial layer, and does not suggest any of the advantages discussed in the instant application with respect to this feature. Since Yokogawa does not disclose the lower resistivity in the epitaxial layer with respect to the silicon substrate, Yokogawa does not render obvious the resistivity ratio recited in claim 2.

Additionally, the Examiner asserts that the motivation to modify the resistivity of the layers is to adjust the breakdown voltage of diode 20 and its on-state resistance (Office Action; page 3, section 4; citing Yokogawa; col. 7, line 65 to col. 8, line 6). However, the cited section of Yokogawa apparently only relates to depleting the layer 12 region and providing a high

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breakdown voltage. There is no suggestion to modify Yokogawa to arrive at the feature of claim 2, and therefore the modification of Yokogawa asserted by the Examiner results from improper hindsight reasoning. Therefore, for at least this additional reason, claim 2 is not rendered unpatentable by Yokogawa.

Claim 3 depends from claim 2 and is therefore allowable for at least the same reasons as claim 2 is allowable.

C. New Claim

New claim 11 depends from claim 1 and is therefore allowable for at least the same reasons as claim 1 is allowable.

Additionally, new claim 11 recites that said silicon epitaxial layer is a single layer. The constitution that the silicon epitaxial layer is a single layer is not shown in Yokogawa. In Yokogawa, two kinds of epitaxial layers 12a and 12b are used, and furthermore, multiple layers including several layers 12a and 12b are disclosed (Yokogawa; figure 1. Therefore, Yokogawa does not disclose or suggest this feature of new claim 11, and therefore for at least this additional reason claim 11 is allowable.

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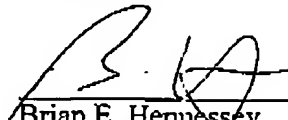
An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that independent claim 1 is in condition for allowance, as well as those claims dependent therefrom. Passage of this case to allowance is earnestly solicited.

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However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,



Brian E. Hennessey
Reg. No. 51,271

CUSTOMER NO.: 026304
TELEPHONE NO.: (212) 940-8800
FAX NO.: (212) 940-8986/7
ATTORNEY DOCKET NO.: 100806-00237 (NECF 20.702)
BEH:pm